AMENDMENT TO THE CLAIMS:

1. (Currently Amended) A method for designing an arm structure for a robot having an arm which can rotate vertically and forward over a prescribed angle around an axial line extending substantially between two shoulders, the method comprising:

selecting a vertical region in front of the robot that can be accessed by the arm in a fully extended state, the location of the selected vertical region being determined with respect to a reference plane; and

selecting a length of the arm and a height of the axis of rotation of the arm based on the selected region so that

a range of rotational motion of the arm in accessing the selected region can be covered by a range in which the fore-and-aft distance to the tip of the arm can be linearly approximated by approximating a path of the tip of the arm with a straight line, wherein the height of the axis of rotation is measured from the reference plane.

2. (Currently Amended) A method for designing an arm structure for a robot according to claim 1, wherein a height of the axis of rotation of the arm is 910 mm, and the arm ~~is adapted to swing~~ swings vertically at least by 240 mm at its free end both upward and downward from a horizontal line.

3. (Previously Presented) A method for designing an arm structure for a robot according to claim 8, wherein a maximum tolerated error of the fore-and-aft

distance of the free end of the arm is 15 mm, and the arm is at least 528 mm long, and swings at least ± 27 degrees from a horizontal line.

4. (Previously Presented) A method for designing an arm structure for a robot according to claim 8, wherein a maximum tolerated error of the fore-and-aft distance of the free end of the arm is 20 mm, and the arm is at least 422 mm long, and swings at least ±35 degrees from a horizontal line.

5. (Previously Presented) A method for designing an arm structure for a robot according to claim 8, wherein a maximum tolerated error of the fore-and-aft distance of the free end of the arm is 25 mm, and the arm is at least 365 mm long, and swings at least ±42 degrees from a horizontal line.

6. (Currently Amended) An arm ~~structure~~ for a robot comprising:

an arm capable of being attached to a robot shoulder which can rotate vertically and forward over a prescribed angle around an axial line extending ~~substantially between two shoulders~~ from the shoulder, wherein:

a height of the axis of rotation of the arm is 910 mm, and the arm swings vertically at least by 240 mm at its free end both upward and downward from a horizontal line extending through the axis of rotation.

7. (Currently Amended) An arm ~~structure~~ for a robot according to claim 6, wherein the arm is at least 365 mm long, and swings at least ±42 degrees from a horizontal line.

8. (Currently Amended) A ~~The~~ method ~~of claim 1, further comprising:~~ for designing an arm structure for a robot having an arm which can rotate vertically and forward over a prescribed angle around an axial line extending substantially between two shoulders, the method comprising:

selecting a vertical region in front of the robot that can be accessed by the arm in a fully extended state, the location of the selected vertical region being determined with respect to a reference plane;

selecting a length of the arm and a height of the axis of rotation of the arm based on the selected region so that a range of rotational motion of the arm in accessing the selected region can be covered by a range in which the fore-and-aft distance to the tip of the arm can be linearly approximated by approximating a path of the tip of the arm with a straight line, wherein the height of the axis of rotation is measured from the reference plane; and

calculating the maximum error in the fore-and-aft distance caused by the linear approximation.